

HOYA

F I L T E R S

*from EVOLUTION
to REVOLUTION*



www.hoyafilter.com

THE PRODUCTION PROCESS OF HOYA FILTERS

Each Hoya filter is the result of research, know-how and complete precision facilities backed by full quality control.

Before production starts, controls are first programmed into a computer. Then the finest materials are carefully mixed by an automatic V-blender for absolute uniformity. After being melted with highly sophisticated equipment, this material is then precision molded with automatic direct pressing equipment. The pressed blanks are next slowly and continuously cooled to remove strain, and are then polished by high-speed, double-surface polishing machines that assure precise surface quality and perfect flatness.

Next is the coating process which improves the filter light transmission ability. And the transmission characteristics are checked by Spectro-Photometer, after which an ultrasonic cleaner removes all foreign matter from the surfaces. Only after passing all of Hoya's quality tests are the filters assembled, finished and made ready for shipment to customers throughout the world.

HOYA SEES AND RESPONDS TO THE NEEDS OF TODAY

HOYA Corporation has diversified its operations by capitalizing on the potential of optoelectronic technologies since its establishment in 1941 as Japan's first specialty manufacturer of optical glass. Today, Hoya is active in four fields of business: Information Technology business makes mask blanks and photomasks for semiconductor devices and liquid crystal panels, optical lenses, and glass memory disks for hard disk drives. The Eye Care provides eyeglasses and operates contact lenses retail shops, as well as makes intraocular lenses for cataract surgery. The Life Care Business provides endoscopic system. The Imaging System produces SLR/compact digital cameras and interchangeable lenses as well as digital camera lens module and microlens.

O U T L I N E

INFORMATION TECHNOLOGY

EYE CARE

MEDICAL

IMAGING SYSTEM

CRYSTAL

HD FILTERS

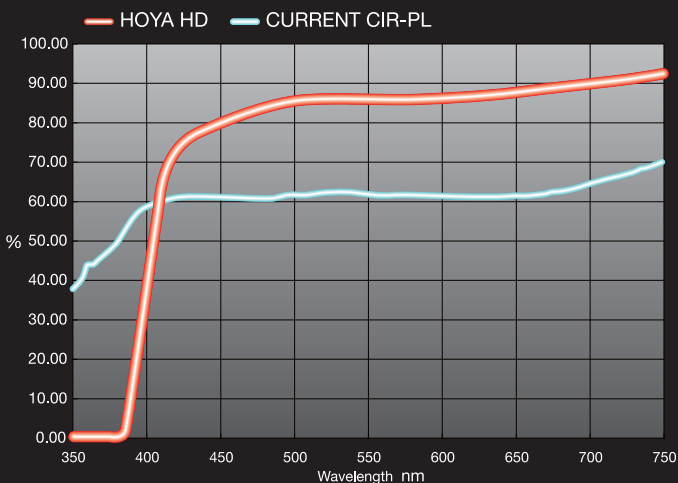
Premium Performance in Lens Protection and Image Enhancement

HARDENED GLASS

Hardened optical glass that has 4 times the breaking strength in ANSI standardized testing (ANSI Z80.3 : 2001) where a steel balls of varying size and weight were dropped from a height of 50 inches onto the glass.

HIGH TRANSPARENCY POLARIZING FILM

The polarizing film is the same as that used in the latest high definition LCD TV screens. It has 25% higher light transmission than standard polarizing film used in current photographic filters.



HARDENED 8 LAYER WATERPROOF MULTI-COATING THAT IS SCRATCH & STAIN RESISTANT

Newly developed industry leading 8-layer multi-coating yields an average light transmission rate of 99.35% between 400 and 700nm (visible spectrum). These coatings greatly reduce reflections off the surface of the glass allowing you to capture more light in your photos.

As with all HOYA multi-coatings, HD HMC is applied in a furnace at high heat, bonding the coating to the surface of the glass. This process is called "hard coating" and it is far more durable than other coating techniques. The chemistry of the top layer is formulated not just to be more durable but to be resistant to oil stains. This means that finger prints and other oils are much easier to remove.

HD FILTER

UV



Best Quality Filter in History

HD GLASS

- High Density Sharp Cut UV Glass
- Chemically Enhanced Optical Glass is 4x Stronger

HD COATING

- 8-layer Anti-Reflective Multi-Coating
- Water & Oil Repellent, Scratch & Stain Resistant

HD FRAME

- Wide-Angle Lens Compatible Ultra Thin Frame
- Glass Mounted with High Pressure Press Technology

A multi-purpose fine-weather filter

Absorbs the ultraviolet rays which often makes outdoor photographs hazy and indistinct. A multi-purpose, fine-weather filter for color as well as black and white films. Also serves as a permanent lens protector.

Available sizes:

52mm 55mm 58mm 62mm 67mm 72mm 77mm 82mm

HD FILTER

CIR-PL



Best Filter Performance in History

HD POLARIZING FILM

- High Transparency & High Durability UV Absorbing Film
- 25% Greater Light Transmission than Standard Polarizing Film

HD COATING

- 8-layer Anti-Reflective Multi-Coating
- Water & Oil Repellent, Scratch & Stain Resistant

HD FRAME

- Wide-Angle Lens Compatible Ultra Thin Frame
- Glass Mounted with High Pressure Press Technology

Color and contrast enhancement

Light rays which are reflected by any surface can become polarised so polarising filters are used to select which light rays enter your camera lens. CIR-PL filters allow you to remove unwanted reflections from non-metallic surfaces such as water, glass etc. They also enable colors to become more saturated and appear clearer with better contrast. This effect is often used to increase the contrast and saturation in blue skies and white clouds. HOYA's polarising filters do not affect the overall color balance of a shot.

Available sizes:

52mm 55mm 58mm 62mm 67mm 72mm 77mm 82mm

FILTER PROTECTOR



Best Lens Protection in History

HD GLASS

- Ultra Clear High Transparency Optical Glass
- Chemically Enhanced Optical Glass is 4x Stronger

HD COATING

- 8-layer Anti-Reflective Multi-Coating
- Water & Oil Repellent, Scratch & Stain Resistant

HD FRAME

- Wide-Angle Lens Compatible Ultra Thin Frame
- Glass Mounted with High Pressure Press Technology

Protect your valued lenses

This is the ultimate in clear filters. It will not affect the color balance or performance of your lenses in the slightest. However, constant use will protect your valued lenses from expensive front element damage which could be caused by dirt, knocks or scratches. A cracked filter costs nothing in comparison to a cracked lens.

Available sizes:

52mm **55mm** **58mm** **62mm** **67mm** **72mm** **77mm** **82mm**

PRO1 Digital *Filter Series*

DESIGNED EXCLUSIVELY
FOR DIGITAL CAMERAS



KEY FEATURES



Digital Multi-Coated

Digital multi-coated filters greatly reduce the appearance of lens flare and ghosting caused by reflections.



Black Almite Frame

Filters feature a black matte aluminum satin finish almite frame which reduces reflections.



Black Rimmed Glass

These filters are equipped with black rimmed glass to reduce the chance of light reflecting off the edge.



Low Profile Frame

Ultra thin filter frames to help avoid vignetting on super wide angle lenses are also designed to hold a lens cap.



Knurling Edge Frame

These filters are equipped with a straight knurling edge for non-slip, easy attachment and removal.



UV Protected Case

Filter cases are UV protected to further lengthen the life of filters.

PRO1 **CIRCULAR PL**

Color and contrast enhancement



▲ With CIRCULAR PL Filter



▲ Without Filter

Light rays which are reflected by any surface can become polarised so polarising filters are used to select which light rays enter your camera lens. CIRCULAR PL filters allow you to remove unwanted reflections from non-metallic surfaces such as water, glass etc. They also enable colors to become more saturated and appear clearer with better contrast. This effect is often used to increase the contrast and saturation in blue skies and white clouds. HOYA's polarising filters do not affect the overall color balance of a shot.

Reduce Glare and Reflections with the CIRCULAR PL

Using the CIRCULAR PL filter, reflections and glare can be reduced significantly from non-metallic surfaces. A camera angle of 30 degrees from the reflecting surface (glass, water, etc.) is ideal for maximum effect.



▲ With CIRCULAR PL



▲ Without Filter



▲ With CIRCULAR PL



▲ Without Filter

Features:



Available sizes:

52mm 55mm 58mm 62mm 67mm 72mm 77mm 82mm

PRO1 □ UV (0)

A multi-purpose
fine-weather filter



▲ With UV(0) Filter



▲ Without Filter

Absorbs the ultraviolet rays which often makes outdoor photographs hazy and indistinct. A multi-purpose, fine-weather filter for color as well as black and white films. Also serves as a permanent lens protector.

Features:



Available sizes:

52mm 55mm 58mm 62mm 67mm 72mm 77mm 82mm

PRO1 PROTECTOR

Protect your valued lenses

**▲ With PROTECTOR Filter**

This is the ultimate in clear filters. It will not affect the color balance or performance of your lenses in the slightest. However, constant use will protect your valued lenses from expensive front element damage which could be caused by dirt, knocks or scratches. A cracked filter costs nothing in comparison to a cracked lens.

Features:**Available sizes:**

52mm	55mm	58mm	62mm	67mm	72mm	77mm	82mm
------	------	------	------	------	------	------	------

PRO1 ND4 • ND8

For wider apertures or
longer exposures



▲ With ND4 Filter

Without Filter ►



▲ With ND8 Filter

▲ Without Filter

These ND filters reduce the amount of light entering the lens so wider apertures can be selected, which is perfect for portraiture to reduce depth of field. Subject appears crisp and clear while the background becomes a soft blur. Also widely used for photographs of waterfalls and other nature scenes to emphasize movement.

Features:



Available sizes:

52mm 55mm 58mm 62mm 67mm 72mm 77mm 82mm

PRO1 SOFTON-A

Clear focus and
soft gradation



▲ With SOFTON-A Filter



▲ Without Filter

Creates a picture with a clear focus and a soft gradation. This effect is especially evident on an object with a point light source. A filter randomly arranging minute lens shaped like drops of water on the surface of a acrylic board scatters the light and results in a soft focus.

Features:**Available sizes:**

52mm	55mm	58mm	62mm	67mm	72mm	77mm	82mm
------	------	------	------	------	------	------	------

PRO1 STAR-4

Add a dramatic
four-cross flare



▲ With STAR-4 Filter



▲ Without Filter

The STAR-4 filter adds a dramatic four-cross flare to very bright areas, giving a soft-focus effect. Ideal for photographs of night scene illumination or other scenes with strong reflections.

Features:**Available sizes:**

52mm	55mm	58mm	62mm	67mm	72mm	77mm	82mm
------	------	------	------	------	------	------	------

PRO1 CLOSE-UP No.3**A world of new creativity****▲ With CLOSE-UP No.3 Filter****▲ Without Filter**

The CLOSE-UP No.3 lens turns a normal lens into a macro by reducing the lens, minimum focusing distance. Depth-of-field is shallow so use as small an aperture as possible. CLOSE-UP NO.3 offers a world of new creativity.

Features:**Available sizes:**

52mm	55mm	58mm	62mm	67mm	72mm	77mm	82mm
------	------	------	------	------	------	------	------

INDEX(Range table with size indication) See table opposite for sizes available.

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PRO1D CIRCULAR PL	8	52mm,55mm,58mm,62mm,67mm,72mm,77mm,82mm				
PRO1D UV (0)	10	52mm,55mm,58mm,62mm,67mm,72mm,77mm				
PRO1D PROTECTOR	11	52mm,55mm,58mm,62mm,67mm,72mm,77mm,82mm				
PRO1D ND4, ND8	12	52mm,55mm,58mm,62mm,67mm,72mm,77mm				
PRO1D SOFTON-A	13	52mm,55mm,58mm,62mm,67mm,72mm,77mm				
PRO1D STAR-4	14	52mm,55mm,58mm,62mm,67mm,72mm,77mm				
PRO1D CLOSE-UP No.3	15	52mm,55mm,58mm,62mm,67mm,72mm,77mm				
GENERAL FILTERS						
UV (0)	20	A	I	Y	S	S
NEUTRAL/CLEAR	20		H	Y		
SKYLIGHT 1B	21	A	E	Y	S	S
PL/PL-CIR	22	C	I	Y	S	S
UV-PL-CIR	25			Y		
COLORED FILTERS						
RED ENHANCER	26	O				
GREEN ENHANCER	27	O				
BLUE ENHANCER	27	O				
PROTRAIT	28	O				
WARM	28	O	O			
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80A, B, C,	30	C	M			
82A, B, C	31	C	M			
81A, B, C	32	C	M			
85A, B, C	33	C	M			
K2, G, 25A	34	C	M			
XO, X1	35	O	O			
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MISTY-SPOT	38	W				
SPLIT-FIELD	39	P				
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VARI-MULTIVISION	46	W				
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AC CLOSE-UP +3,+4, +5	48		V			
CLOSE-UP (+1,+2,+3,+4)	48	L	Q			
CLOSE-UP (+1,+2,+4)	48	U	Q			
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Size table (mm)

Pitch	Size	A	B	C	D	E	F	G	H	I	J	K	L	M	Size	Pitch
0.50	24.0	○	○	○	○										24.0	0.50
0.50	27.0	○	○	○			○		○						27.0	0.50
0.75	27.0	○	○		○	○		○							27.0	0.75
0.75	30.0	○	○		○		○		○	○			○		30.0	0.75
0.50	30.5	○	○	○	○										30.5	0.50
0.50	34.0	○	○		○		○		○	○			○		34.0	0.50
0.75	37.0	○	○			○	○	○	○	○	○		○		37.0	0.75
0.50	37.5	○	○	○	○										37.5	0.50
0.50	39.0	○	○	○	○							○	○		39.0	0.50
0.50	40.5	○	○	○	○		○								40.5	0.50
0.75	43.0	○	○	○	○	○	○		○				○		43.0	0.75
0.75	46.0	○	○	○	○	○	○	○		○	○	○	○	○	46.0	0.75
0.75	49.0	○	○	○	○	○	○	○		○	○	○	○	○	49.0	0.75
BAYONET	50.0	○	○	○		○				○			○		50.0	BAYONET
0.75	52.0	○	○	○	○	○	○	○		○	○	○	○	○	52.0	0.75
0.75	55.0	○	○	○	○	○	○	○		○	○	○	○	○	55.0	0.75
0.75	58.0	○	○	○	○	○	○	○		○	○	○	○	○	58.0	0.75
BAYONET	60.0	○	○	○		○				○				○	60.0	BAYONET
0.75	62.0	○	○	○	○	○	○	○		○	○	○	○	○	62.0	0.75
0.75	67.0	○	○	○	○	○	○	○		○	○	○	○	○	67.0	0.75
0.75	72.0	○	○	○	○	○	○	○		○	○	○	○	○	72.0	0.75
0.75	77.0	○	○	○	○	○	○	○		○	○	○	○	○	77.0	0.75
0.75	82.0	○	○	○	○	○	○	○		○	○	○		○	82.0	0.75
0.75	86.0	○		○	○		○								86.0	0.75
0.75	95.0	○		○	○										95.0	0.75

Pitch	Size	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Size	Pitch
0.50	24.0														24.0	0.50
0.50	27.0														27.0	0.50
0.75	27.0														27.0	0.75
30.0	30.0														30.0	30.0
0.50	30.5														30.5	0.50
0.50	34.0														34.0	0.50
0.75	37.0								○						37.0	0.75
0.50	37.5														37.5	0.50
0.50	39.0														39.0	0.50
0.50	40.5														40.5	0.50
0.75	43.0								○						43.0	0.75
0.75	46.0	○	○	○	○	○									46.0	0.75
0.75	49.0	○	○	○	○	○	○	○	○	○	○	○			49.0	0.75
BAYONET	50.0														50.0	BAYONET
0.75	52.0	○	○	○	○	○	○	○	○	○	○				52.0	0.75
0.75	55.0	○	○	○	○	○	○	○	○	○	○	○			55.0	0.75
0.75	58.0	○	○	○	○	○	○	○	○	○			○		58.0	0.75
BAYONET	60.0														60.0	BAYONET
0.75	62.0	○	○	○	○	○	○	○	○			○	○	○	62.0	0.75
0.75	67.0	○	○	○	○		○	○	○			○	○	○	67.0	0.75
0.75	72.0	○	○	○			○	○	○			○	○	○	72.0	0.75
0.75	77.0	○	○				○	○	○				○	○	77.0	0.75
0.75	82.0	○					○								82.0	0.75
0.75	86.0														86.0	0.75
0.75	95.0														95.0	0.75

BAYONET 50 : Used on older Hasselblad lenses.

BAYONET 60 : Used on current Hasselblad lenses.

RING GUIDANCE TABLE

SERIES OR FILTER TYPE	RING THICKNESS	FRONT THREAD
ALL PRO1 SERIES	3mm	Yes
ULTRA SERIES (EXCEPT UV-PL-CIR)	3mm	No
ULTRA SERIES, UV-PL-CIR SUPER HMC PL-CIR PL-CIR(WIDE ANGLE)	5mm	No
OTHER PL & PL-CIR	9mm	Yes
OTHER GENERAL, CREATIVE & COLOURED FILTERS	5mm	Yes

Please be sure to check the thread pitch when using filters with video or digital cameras.

HOYA offers a wide variety of superior quality filters for use in all imaging applications such as 35mm SLR cameras, Medium Format, Large Format, Video, Movie and Digital. It is important to select the best filters for your needs, as choosing inferior brands can deteriorate the performance of your high quality lenses. HOYA filters guarantee you the highest standards so you can create the best images.

In order for you to fully understand the wide range which HOYA offers, the three main categories, into which our filters are grouped, are explained below:

GENERAL FILTERS

This group includes everyday filters which can be left on your lenses, such as Skylight 1B, UV and Polarising. These are the first filters that every photographer should ensure they own. Skylight and UV filters should be constantly fitted to a lens to give improved clarity and color balance as well as offering protection to your lens. Polarising filters have several uses such as eliminating unwanted reflections, increasing color saturation and enhancing contrast. As to whether you should use Circular Polarising or Linear Polarising filters with your camera, we recommend that you refer to the detailed explanation later in this catalogue.

CREATIVE FILTERS

This is a new classification, exclusive to HOYA. Although similar to general filters, they produce a subtle, but realistic result which may be used to artistic effect. They are also suitable for use as everyday protection filters and may be combined with other types such as PL-Circular and UV for enhanced effect. In this case, we recommend the use of PRO-1 or ULTRA series models which have thin rings and multicoating to avoid vignetting and ghosting.

COLORED FILTERS

As their names suggests, these filters use HOYA colored glass. They are used for color correction of different light sources when using color film, or for controlling contrast with Black & White film. Color correction filters are important as color films do not have the flexibility of the human eye to automatically adjust to different situations. Black & White films register colors as shades of grey and the rendition of each color in a scene is important, so filters can be used to control this. The color of the glass used in all these filters is carefully controlled and to reduce the possibility of color shift over a period of time, such high quality filters are coated or multicoated on both sides. This maintains the desired effect and gives a long service life.

SPECIAL EFFECT FILTERS

As you will see from the images later in this catalogue, HOYA makes it possible to add many different special effects to your pictures, such as star-bursts, close-ups, softening and multi-images. It is simple to achieve outstanding creative or unusual results and take special photographs for memorable occasions such as weddings, birthdays and holidays.

Why Coated?

There are three main reasons why filters should be coated. First, coating enhances light transmission, second, it protects the surface of the filter and third, it remove ghosting and flare, particularly between the rear of a filter and the surface of a lens. In general, light transmission increases as more layers of coating are applied.

Within these three groups, we offer a choice of grades with different coatings as follows:

STANDARD

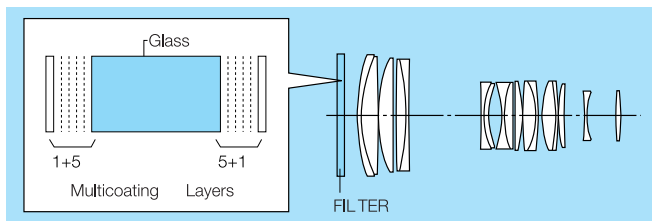
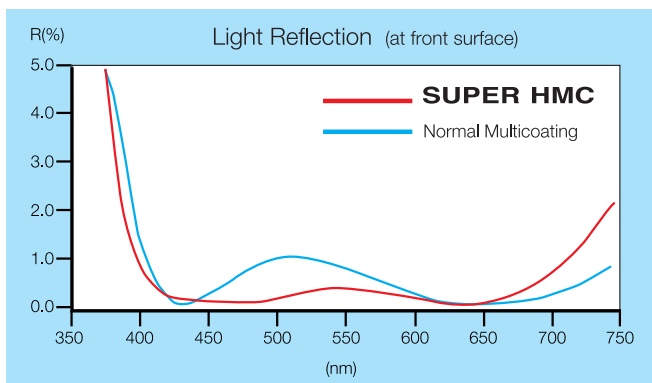
These filters offer both amateur and professional photographers HOYA's famous quality at reasonable prices. They have coatings applied to both surfaces to suppress reflection and increase light transmission. There are a few exceptions in the special effects range which, due to the special materials used in construction, do not have coatings applied.

HMC (HOYA MULTI COATED)

These popular filters are renowned for their ability to minimise reflection at the filter surfaces which reduces flare and ghosting. The result is an average light transmission of over 97%, giving sharp contrast and well balanced color. HOYA HMC filters are recommended for enhancing the performance of today's multicoated lenses.

SUPER HMC

These outstanding filters offer revolutionary performance in light transmission and color balance. 12 layers of Super Multicoating are applied to the surfaces of the Skylight 1B and UV(0) models, which produces an average transmission of 99.7%! Coupled with maximum surface precision, this allows increased resistance to flare and stunning images can be recorded at wide apertures without compromising the performance of your lenses. Our ultra thin Circular Polarising filters have seven layers of Multicoating applied to their rear surface to eliminate internal reflections and ghosting. Advanced thin selective film is used to guarantee perfectly polarised light with neutral color balance. Their slim profile of just 5mm avoids any vignetting problems and makes them ideal for use with wide angle lenses. There is no front female thread, but they do accept our push-on lens caps. HOYA Super HMC filters will appeal to the most demanding of photographers who require the ultimate in performance.



PRO 1 FILTERS

New technology has enabled HOYA to produce superior performance Skylight and UV glass is just 1mm in thickness, which is tempered for increased strength. The glass is mounted in a super slim 3mm ring (with front filter thread), which avoids vignetting and results in a 40% weight saving over standard models. Twelve layers of super multicoating are applied to the surfaces to produce an average light transmission of 99.7%!

PRO 1 DIGITAL FILTERS

Newly formulated multi-coating for digital camera CCD or CMOS sensor. These image capture devices are highly susceptible to reflections - this stray light can ruin your photographs! Don't risk your valuable photos by using bare-glass filters.

UV (0)

A multi-purpose fine-weather filter



▲ With UV Filter



▲ Without Filter

Absorbs the ultraviolet rays which often makes outdoor photographs hazy and indistinct. A multi-purpose, fine-weather filter for color as well as black and white films. Also serves as a permanent lens protector.

NEUTRAL/CLEAR

Ultimate in clear filters

Mounted in an ULTRA slim 3mm ring, this is the ultimate in clear filters. Made from completely transparent superior grade optical glass, it will not affect the color balance or performance of your lenses in the slightest. However, constant use will protect your valued lenses from expensive front element damage which could be caused by dirt, knocks and scratches.

SKYLIGHT 1B

For outdoor color photography



▲ With SKYLIGHT 1B Filter



▲ Without Filter

Reduces excessive bluishness that frequently occurs in outdoor color photography, especially in open shade under a clear, blue sky. The absorption peak is in the range which corresponds to the film's green spectrum. This means outstanding outdoor shots with superb color balance and clarity under all conditions. Also keeps skin tones free of colored reflections from nearby objects such as the shade of trees.



PL/PL-CIR

Color and contrast enhancement



▲ With PL Filter



▲ Without Filter

What is a polarizing filter?

Light rays which are reflected by any surface can become polarised so polarising filters are used to select which light rays enter your camera lens. CIRCULAR PL filters allow you to remove unwanted reflections from non-metallic surfaces such as water, glass etc. They also enable colors to become more saturated and appear clearer with better contrast. This effect is often used to increase the contrast and saturation in blue skies and white clouds. HOYA's polarising filters do not affect the overall color balance of a shot.

How to select the correct Polarizing Filter

Two kinds of polarizing filters are the PL (Linear Polarizing) and PL-CIR (Circular Polarizing) filters which have the same effect of reducing glare, however, there are differences in the way each works in combination with your specific camera so it is important to research and choose the correct version of filter for your camera.

Many of today's cameras use semi-silvered mirrors or prisms to split the light (a.k.a. beam) entering the viewfinder in order to calculate exposure and focusing distance. PL filters can sometimes interact with these light controlling devices to give unpredictable exposure or focusing. If your camera, whether auto or manual, is equipped with this kind of device, we recommend using a PL-CIR filter.

Both types of filters allow you not only to remove unwanted reflections from non-metallic surfaces such as water, glass etc., but also filter out atmospheric haze enabling colors to become more saturated and appear clearer with a much sharper contrast. these effects will prove to be invaluable to photographers at any level of interest.



▲ With PL-CIR Filter



▲ Without Filter

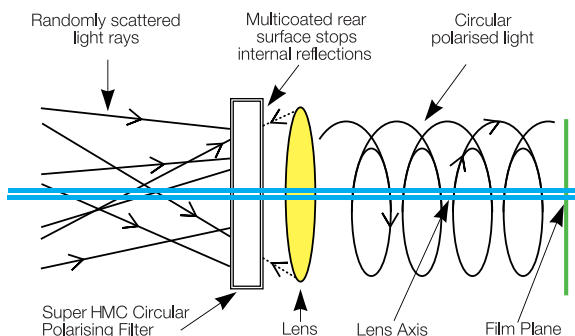
How to use a polarizing filter

PL filters achieve their greatest effect of eliminating glare when used at a 30-40 degree angle to a reflective surface (like glass or water). At midday when the sun is directly overhead, or at a 90 degree angle, the filter will have the least effect. These effects are easily visible by rotating the filter and looking through the viewfinder of the camera. Keep in mind that you will first need to adjust the polarizing filter before setting the exposure controls.

For deepening the color of the blue sky and making the clouds jump out at you, hold the camera at a right angle to the sun and take the photo when the sun is at a 30-40 degree angle in the sky.

When photographing distant subjects, scenery sometimes appears bluish. This is also caused by light polarization. Using the polarizing filter will help to greatly reduce the softness caused by atmospheric haze.

There are a variety of ways in which the use of polarizing filters can help you capture that perfect shot. Reducing the haze and enhancing colors may seem like simple effects, but once used, these effects will prove to be invaluable to photographers at any level of interest.

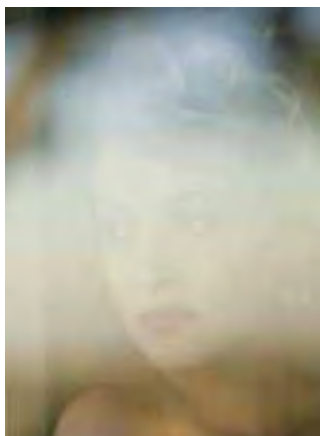


Reduce Glare and Reflections with the CIRCULAR PL

Using the CIRCULAR PL filter, reflections and glare can be reduced significantly from non-metallic surfaces. A camera angle of 30 degrees from the reflecting surface (glass, water, etc.) is ideal for maximum effect.



▲ With CIRCULAR PL



▲ Without Filter

UV-PL-CIR

A revolutionary “hybrid” design



▲ With UV-PL-CIR Filter



▲ Without Filter

A revolutionary ‘hybrid’ design which combines the effect of two different filters in one ring. This filter eliminates ultraviolet rays to remove haze from outdoor shots as well as polarizing the light to remove reflections, and increase color saturation, without affecting the overall color balance. Fitted in a slim rotating 5mm ring, this filter is invaluable to landscape and other photographers who need to avoid vignetting with wide angle lenses.

RED ENHANCER (INTENSIFIER)

Enhance red, orange and brown



▲ With RED ENHANCER Filter



▲ Without Filter

Also known as a “didymium” filter, this is used to enhance red, orange and brown subjects to give more color saturation and contrast, while having very little effect on other colors. It can be used in many situations such as architecture where certain building features need emphasizing, or for landscapes to enhance foliage and rocky features.

GREEN ENHANCER (GREEN FIELD)

Improve outdoor shots



▲ With GREEN ENHANCER

Without Filter ►



Intensifies and enhances colors in the Green region of the spectrum without adversely affecting other colors. It is particularly useful for improving outdoor shots which include nature, flowers, landscapes and water. Combination use with PRO 1 UV (0) or PL-Circular is recommended for increased contrast and sharpness.

BLUE ENHANCER (BLUE INTENSIFIER)

Brighten landscapes



▲ With BLUE ENHANCER

Without Filter ►



Intensifies and enhances colors in the Blue region of the spectrum without adversely affecting other colors. It is particularly useful for brightening seascapes and pale or cloudy skies, but also suitable for when, due to the sun's direction, polarizing filters are ineffective in increasing the saturation of a blue sky. Combination use with PRO 1 UV (0) or PL-Circular is recommended for increased contrast and sharpness.

PORTRAIT

Make skin tones more vivid and clear



▲ Without Filter



◀ With **PORTRAIT** Filter

Enhances pink and reduces both yellow and orange to make human skin tones more vivid and clear. Combination use with PRO 1 UV (0) is ideal when shooting under fine blue skies.

WARM

Make skin tones more suntan



▲ Without Filter



◀ With **WARM** Filter

Reduces colors in the blue to green range of the spectrum and makes the color of human skin look more sun-tanned. Combination use with PRO 1 UV (0) is recommended for outdoor shooting.

FL-W

Correct greenish tones



With FL-W Filter

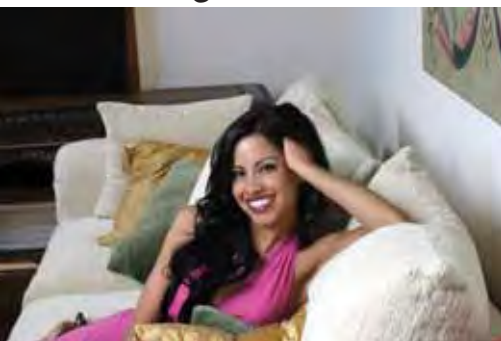
Without Filter ►



Used to correct the greenish tone that appears when daylight type film is used under fluorescent lighting. FL-W is for use with warm white or white type fluorescent lamps. It is recommended that auxiliary light sources be used when long exposures become necessary due to insufficient light.

FL-DAY

Correct greenish tones



With FL-DAY Filter

Without Filter ►



Used to correct the greenish tone that appears when daylight type film is used under fluorescent lighting. FL-DAY is for use with daylight type fluorescent lamps. It is recommended that auxiliary light sources be used when long exposures become necessary due to insufficient light.

80A • 80B • 80C

Light balancing filters



◀ With 80A Filter



◀ With 80B Filter



◀ With 80C Filter



◀ Without Filter

These are color conversion filters for the use of daylight type color film with artificial light sources. 80A increases the color temperature from 3200°K to 5500°K for use with 3200°K lamps. 80B increases the color temperature from 3400°K to 5500°K for use with photoflood lamps. 80C increases the color temperature from 3800°K to 5500°K for use with clear flash bulbs.

82A • 82B • 82C

Light balancing filters



◀ With 82A Filter



◀ With 82B Filter



◀ With 82C Filter



◀ Without Filter

These are light balancing filters used to increase the color temperature slightly for a cooler (bluer) tone. Corrects the tendency toward reddish tones. As an example, select the 82B when using tungsten Type B film (3200°K) with ordinary household 100W electric bulbs (2900°K). These filters are also used to prevent the reddish tones in early morning or late evening light for natural skin tones. These filters can be used together, but do not mix the 81 and 82 series filters since they cancel each other out.

81A • 81B • 81C

Decrease color temperatures



◀ With 81A Filter



◀ With 81B Filter



◀ With 81C Filter



◀ Without Filter

These are light balancing filters used to decrease the color temperature slightly for a warmer (redder) tone. Corrects the tendency toward bluish tones. For example, the 81A should be selected when using tungsten type B color film (3200°K) with photoflood lamps (3400°K) These filters can be used together.

85 • 85B • 85C

Color conversion filters



◀ With 85 Filter



◀ With 85B Filter



◀ With 85C Filter



◀ Without Filter

These are color conversion filters for the use of tungsten type color films in daylight. 85 decreases the color temperature from 5500°K to 3400°K for the use of Type A color film. 85B decreases the color temperature from 5500°K to 3200°K for the use of Type B color film. 85C decreases the color temperature from 5500°K to 3800°K. The effect obtained is the same as with daylight type color film used in daylight.

K2 (YELLOW)

For clear contrast



▲ Without Filter

◀ With K2 Filter

Especially useful for clear contrast between blue sky with clouds and foreground. Provides a natural tonal rendition. Often used for subjects at intermediate distances.

G (ORANGE)

For balancing contrast



▲ Without Filter

◀ With G Filter

Increases contrast between reds and yellows. Particularly useful for distant outdoor shots taken with a telephoto lens. Also useful in color photography for spectacular sunsets, seascapes, etc.

25A (RED)

Increases contrast



▲ Without Filter

◀ With 25A Filter

Especially effective for increasing contrast. Ideal for dramatic cloud effects in landscapes. Can also be applied creatively in color and infrared photography.

X0 (YELLOW GREEN)

Great for outdoor portraits



▲ Without Filter

◀ With X0 Filter

Used primarily for black and white photography. X0 is highly effective for outdoor portraits because red is rendered dark while green appears lighter. Great for correcting skin tones, bringing out facial expressions in close-ups and emphasizing the feeling of liveliness.

X1 (GREEN)

Great for indoor portraits



▲ Without Filter

◀ With X1 Filter

Used primarily for black and white photography. X1 is highly effective for indoor portraits under tungsten lighting.

CENTER-SPOT

Center focus for portraits



▲ With CENTER-SPOT Filter

Without Filter ►



A close-up lens with a hole in the center. The periphery of the picture is rendered a delicate, soft-focus effect while the central image is sharply focused.

SOFT-SPOT (Sand screen & Soft screen)

Two types of center focus for portraits



▲ With SAND SCREEN



▲ With SOFT SCREEN



Both have a clear center spot which makes the central image stand out clearly. SAND SCREEN has a smoky appearance while SOFT SCREEN has an irregularly uneven surface. With SOFT-SPOT, the size of the clear part in the center of the picture varies depending on the lens and aperture used.

COLOR-SPOT

Adds color effects for portraits



◀ With RED



◀ With GREEN



◀ With YELLOW



◀ With GRAY



A colored glass filter with a hole in the center. Available in yellow, green, red and gray. The central image stands out clearly while the background appears the color of the filter.

MISTY-SPOT

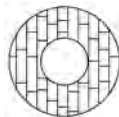
Gradual, Breeze, Windmill & Halo



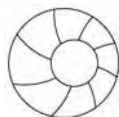
▲ With Gradual



▲ With Breeze



◀ With Windmill



◀ With Halo



Available in four types: Gradual, Breeze, Windmill and Halo. They have a sharp central image with a pleasant blurring of the outer field. With Gradual, blurring that appears to emanate from the center. Breeze has an unidirectional streaky blurring of the background. With Windmill, blurring that appears to swirl about the center, and with Halo, blur that appears to radiate from a single point at the edge of the field. *The Misty Spot series are only available in select sizes (49, 52, 55mm)

SPLIT-FIELD

Half close-up special effect



▲ With
SPLIT-FIELD ►



One-half of a close-up lens with the other half open. One-half of the picture receives a close-up effect while the other half is normal. Both very close and far subjects can be in focus at the same time. Or one-half of the picture can be out of focus for special effects.

DUAL-IMAGE

Double exposure special effect



▲ With DUAL-IMAGE



One half of dual-image is transparent while the other is black. Used for producing special effects by taking double exposures. For example, the same person can be photographed on both sides of the same picture. When taking such photographs with this filter, refer to the instruction manual of your camera. Use of a tripod is recommended.

STAR-4 • STAR-6 • STAR-8

Add a dramatic cross flare



▲ With STAR-4 Filter



▲ With STAR-6 Filter



▲ Without Filter

◀ With STAR-8 Filter

STAR-4 adds a dramatic four-cross flare to very bright areas, giving a soft-focus effect. Ideal for photographs of ladies wearing jewelry or other objects with strong reflections. STAR-6 (six-pointed light flares) and STAR-8 (eight-pointed star flares) can also be used for a variety of effects.

VARIOCROSS

Variable cross flare



Two colorless glass plates with etched parallel lines on each surface and set in independent rotating frames. By rotating these frames, the effect can be varied to produce any desired expression for any highly reflective scene.



RAINBOW-SPOT

A rainbow of color effect



Made of glass and provided with rotating frames. 1,270 ultra-fine parallel grooves per inch pick up and diffract each tiny point of light into a rainbow of color.

ND(NEUTRAL DENSITY) X2 X4 X8

For wider apertures or longer exposures



▲ With ND X8 Filter



▲ With ND X4 Filter



▲ With ND X2 Filter



▲ Without Filter

Neutral Density filters are often ignored by photographers, but they have several uses and offer the possibility to get otherwise unachievable results. ND filters appear grey and reduce the amount of light reaching the film. They have no effect on color balance. Their four main uses are:

- 1) To enable slow shutter speeds to be used, especially with fast film, to record movement in subjects such as waterfalls, clouds, cars, the sea, etc.
- 2) To decrease depth of field by allowing wider apertures to be used, which helps separate subjects from their background.
- 3) To decrease the effective ISO of high speed film (i.e., above ISO 400) and allow it to be used outdoors in bright situations.
- 4) To allow movie and video cameras (which have fixed shutter speeds) to film subjects such as snow, sand or other bright scenes which would normally cause overexposure.

ND X400

Make moving subjects invisible



▲ With ND X400 Filter

Without Filter ►



Photographing solar eclipses and ultra-bright light sources can be extremely dangerous. This filter reduces light values by 9 stops to less than 1/500th of its original intensity and allows safe photography. It can also be used to achieve super slow shutter speeds in daylight to render moving subjects invisible.

HALF ND X4

Control bright/dark contrast



▲ With HALF-ND X4 Filter

Without Filter ►



One half of this filter is NDX4 Neutral Density and the other half is clear, with a soft boundary between the two. It is used to control bright/dark contrast, by reducing half the shot by 2 stops. Particularly useful in landscape photography, the rotating mount allows bright skies to be easily controlled for dramatic effect.

BLACK MIST

A subtle softening filter



The Hoya Black Mist filter is a subtle softening filter that lowers contrast and gives an over-all soft look to portraits.

WHITE MIST

Pleasing effect for softening portraits



The Hoya White Mist filter yields a very subtle, pleasing effect for softening portraits. The white sheen of the filter gives strong highlights a soft glow.

FOG FILTER

Produce the effect of dense fog



▲ Without Filter

◀ With FOG Filter

Lightly veils the entire picture in white. Available in a set of two: FOG (A) and FOG (B). FOG (B) has a stronger effect than FOG (A). Both can be used together to produce an effect similar to dense fog. The effect can be varied by changing the aperture of the lens, but stopping down too far will reduce the effect.

DIFFUSER • DUTO

The beauty of a Soft-focus effect



▲ With DIFFUSER Filter



▲ With DUTO Filter

Both are diffusion type filters, but DIFFUSER gives a soft-focus effect due to its irregularly uneven surface while DUTO has fine concentric lines etched on its surface. The center of the picture is usually sharp with DUTO, but DIFFUSER gives an overall soft-focus effect. Both are particularly effective in portraiture and commercial

SOFTENER A • B

Scatters light for a soft-focus



▲ With **SOFTENER A** Filter



▲ With **SOFTENER B** Filter

A filter with randomly arranged minute lenses shaped like drops of water on an acrylic surface which scatters the light and results in a soft focus. Creates a picture with a clear focus and a soft gradation. This effect is especially evident with an object with a point light source. Color reproduction is easy and there is no need for exposure adjustment.

SPECTRAL CROSS

Produce soft-focus and cross effects



▲ Without Filter



◀ With **SPECTRAL CROSS**

A filter made by sandwiching black gauze-like fiber between two pieces of colorless, transparent optical glass in a rotating frame, producing both soft focus and cross effects.

MULTIVISION

Create exotic compositions



▲ With MULTIVISION 5F

Without Filter ►



Available in five types: (3PF), (3F), (5F), (6F) and (6PF). Made of optical glass precisely cut into a variety of facets, MULTIVISION helps create exotic, fantastic compositions of color patterns and combinations. Effect is strongest with a relatively dark background and at larger apertures. The multi-images appear closer together with wide-angle lenses and farther apart with telephoto lenses.

VARI MULTIVISION

Create multi-images



▲ With VARI MULTIVISION

Without Filter ►



Two 2-face MULTIVISION set in independent rotating frames create multi-images that can be varied from 2 to 4-faces by rotating the frames.

COLOR-MULTIVISION

Produces colorful multi-images



◀ With 3F



◀ With 3F



◀ With 5F



◀ With 5F

Available in two types: (3F) with three faces in blue, green and red; and (5F) with five faces evenly divided into green and orange. These filters produce the dynamic professional color multi-images often seen in TV or commercial photography. Results are striking with either still or movie cameras.

CLOSE-UP

A world of new creativity



▲ With AC+5



▲ With AC+4



▲ With +1



▲ With UV Filter+2



▲ Without Filter

Available in +1, +2, +3, +4 and +5 diopters for close-up photography. Depth-of-field is shallow so use as small an aperture as possible. CLOSE-UPS offer a world of new creativity.



MACRO CLOSE-UP

Discover the art of nature



▲ With MACRO CLOSE-UP

Without Filter ►



A lens of 2-element, 2-group construction and a +10 diopter rating. Resolution is outstanding and focusing is possible at 10cm for super close-ups of insects, flowers and other small objects. The magnification is about 1:2 with a 50mm standard lens (35mm camera), roughly equates to a 100mm telephoto lens. The lens should be stopped down as much as possible to get maximum depth-of-field.

SEPIA

Give a nostalgic sepia color effect



▲ With SEPIA Filter

Without Filter ►



These two filters give a nostalgic effect to otherwise ordinary color photographs. Sepia tones are produced across the whole image, as if taken many years ago in Black & White, having then discolored with age. Sepia B has a stronger effect than Sepia A.

HALF COLOR

For dramatic color tones



▲ With PINK



▲ With GREEN



▲ With ORANGE



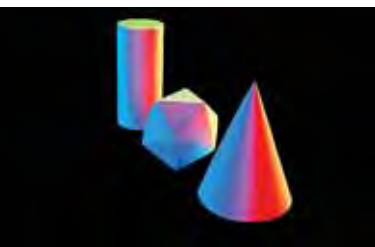
▲ With RED

Made by sandwiching a gelatin filter between two optical glass plates. Similar to DUAL-COLOR except one-half is clear. Set in a rotating frame for added effectiveness.

Color options: Pink, Yellow, Orange, Red, Emerald, Green, Brown, Blue, Violet, Light Gray, Dark Gray

POP FILTER SET

For original color effects



▲ With R+G+B



▲ Without Filter



▲ With R+G+B



Available in a set of three color filters: red, green and blue. Used individually or in combination, extremely original color effects can be obtained. Also great for multi-exposure creativity.

FANTASY COLOR SET

Great for a special impact



▲ With MOONLIGHT BLUE



▲ With VIVID PINK



▲ With DEEP MAUVE



▲ Without Filter

This set of three strongly colored filters in Moonlight Blue, Vivid Pink and Deep Mauve can be used to give a single color effect over the whole of a picture. Used in daylight, the Moonlight Blue filter gives the effect of a nighttime moonlit scene whilst the other two filters allow graphic and unusual images to be produced for special impact.

GRADUAL COLOR

Gives dramatic color gradations



▲ With BLUE



▲ Without Filter



Acrylic filters similar to half-color, except that color density gradually decreases near the center of the filter allowing emphasis of foregrounds or backgrounds. Mounted in a rotating frame, 7 colors are available. Pink, Yellow, Emerald, Tobacco, Blue, Mauve and Gray. Their color gradually fades out so the boundary between the colored and transparent sections will not become apparent even with the lens aperture stopped down.

TRICOLOR

For original color compositions



▲ With TRICOLOR-PARA



▲ With TRICOLOR-TRI



Divided into three color sections (PARA: blue, yellow and pink, TRI: blue, green and red) for imaginative three-tone effects. Available in two types: Parallel and Triangle. The effect varies depending on the focal length of the lens used and the aperture.

DUAL-COLOR

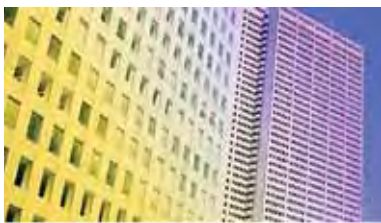
For an original artistic touch



▲ With R/B



▲ With O/G



▲ With Y/P

Available in three types: O/G (orange/green), Y/P (yellow/purple) and R/B (red/blue). Made by sandwiching gelatin filters between two pieces of optical glass, DUAL-COLOR is available in a variety of two-color combinations. Contrasting foreground and background, land and sea, are only a few of the fantastic possibilities.

PL-COLOR

For dramatic color creation



Available in four types: B(blue), Y(yellow), O(orange) and R(red). A combination of gray and colored polarizing filters. Any color from gray to the full color of the filter can be obtained by rotating the filter frame.

VARIO PL-COLOR

Many color possibilities



Available in five types: Y/B, Y/G, Y/R, R/B and R/G. This filter is a combination of one gray polarizing filter and two colored polarizing filters. The color can be varied by rotating the filter frames. Many color possibilities help create new emotional effects never seen before.

POL-CONVERSION

Eliminates undesirable reflections



▲ With POL-CONVERSION

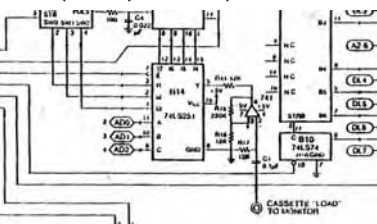
Without Filter ►



A linear polarizing sheet is sandwiched between one transparent optical glass and one color conversion filter (85B). Enables tungsten film to be used in daylight and also has the effect of a regular polarizing filter. Eliminates undesirable reflections from water, windows and non-metallic surfaces. Also serves to darken the sky as well as increasing color saturation in general. Mounted in a rotating frame.

INFRARED

(R72, RM90)



▲ With R72



▲ Without Filter



▲ With RM90



▲ Without Filter

Used for photography with infrared film. Infrared film is also sensitive to ultraviolet rays and the shorter wavelengths of the visible spectrum so it is necessary to filter out all but the infrared rays. R72 passes only infrared rays above 720nm; RM90 passes only that above 900nm. Often used in crime detection, medical photography, detection of distribution of vegetation, etc. In ordinary photography with infrared film or infrared color film, the Y (K2), O(G), R(25A) and other filters can also be used to change the contrast or color effect.

LENS ACCESSORIES

MULTI LENS HOOD

Protects the lens from direct light which may cause glare. Most suitable for zoom lenses, tele, wide and standard lenses. Easy to use for each type by one touch.



	SLR 35mm	Large Format (6×6,6×7)	49mm	52mm	55mm	58mm	62mm	67mm	72mm	77mm
Tele	70mm~	150mm~	32°	29°	32°	26°	33°	28°	33°	30°
Standard	55~70mm	110~140mm	44°	41°	44°	38°	45°	40°	46°	43°
Wide	35~50mm	65~100mm	72°	60°	78°	63°	80°	72°	66°	63°

WIDE LENS HOOD

	SLR 35mm	Large Format (6×6,6×7)	49mm	52mm	55mm	58mm	62mm	67mm	72mm	77mm
Tele	70mm~	130mm~	38°	36°	38°	34°	44°	38°	36°	32°
Standard	40~70mm	90~150mm	52°	50°	56°	54°	60°	54°	52°	50°
Wide	28~50mm	60~100mm	74°	74°	78°	78°	76°	74°	78°	76°

STEP-UP/DOWN RING

Enables the use of different size filters with one particular lens.

Pitch		0.75	0.75	0.75	0.75	0.75	Bayonet	0.75	0.75	0.75	Bayonet	0.75	0.75	0.75	0.75	0.75
	φ	30mm	37mm	46mm	48mm	49mm	50mm	52mm	55mm	58mm	60mm	62mm	67mm	72mm	77mm	82mm
0.75	30mm				○											
0.75	37mm					○										
0.75	46mm				○	○		○	○	○						
0.75	48mm			○		○		○	○	○						
0.75	49mm			○	○			○	○	○					○	
Bayonet	50mm							○×	○×	○×						
0.75	52mm			○	○	○			○	○		○	○		○	
0.75	55mm			○	○	○		○		○		○	○		○	
0.75	58mm			○	○	○		○	○			○	○		○	
Bayonet	60mm											○×	○×	○×		
0.75	62mm							○	○	○			○	○	○	
0.75	67mm								○	○			○	○	○	
0.75	72mm											○	○		○	
0.75	77mm									○			○	○		○
0.75	82mm														○	

BAYONET 50 : Used on older Hasselblad lenses.

BAYONET 60 : Used on current Hasselblad lenses.

CLIP CAP/PUSH-ON CAP

	46mm	49mm	52mm	55mm	58mm	62mm	67mm	72mm	77mm	82mm
Clip Cap	○	○	○	○	○	○	○	○	○	
Push-on Cap	○	○	○	○	○	○	○	○	○	○
Push-on Cap for ULTRA					○	○	○	○	○	

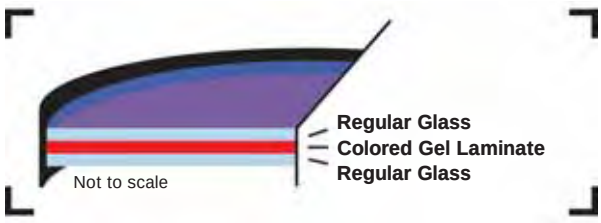
※only for SUPER HMC PL-Cir

A L L F I L T E R S A R E



How another Large Manufacturer makes Filters

Imagine a sandwich made with a thin gel or even colored glue between two pieces of regular glass, similar to the glass used in windowpanes. This is how some other brands of optical filters are made. These types of filters are cheap to produce, but inferior for several reasons:



1. Over time, the expansion and contraction of the different materials can lead to delamination, which is a separation of the different materials. This will show up as bubbling, peeling, or discoloration, rendering the filter useless.
2. The color of the gel can shift or fade over a relatively short period of time and will not yield the same color rendition.
3. If all six surfaces, three layers, two surfaces each, are not perfectly flat and perfectly parallel, the filter causes a “lens effect” which degrades the optical performance, or in extreme cases, shift or limit the focus of the lens it is used with.

How Hoya Makes Filter Glass



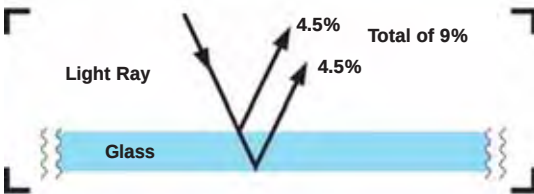
To make its filters, Hoya adds different raw elements, like gold, and chemicals compounds to its optical glass silicates while mixing in a molten state. To insure consistency in glass manufacturing, Hoya uses a furnace called an Automatic V blender to mix the different materials continuously at a highly controlled rate. This ensures that Hoya filter glass is uniformly colored all the way through. There is never any risk of uneven coloration, shifting or fading of the color, or delamination. The two surfaces are ground and polished for perfect flatness.

NOT CREATED EQUAL!



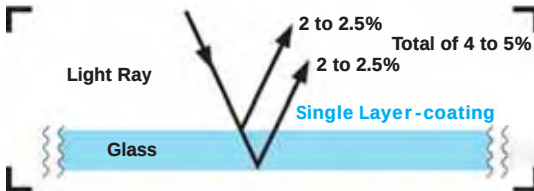
Hoya Coating and Multi-Coating, the Quality Difference.

Hoya manufactures a full line of filters in both standard and Hoya multi-coated. The difference between Hoya's standard line and that of other manufacturers is that Hoya standard filters have a layer of anti-reflective coating bonded to each surface of the glass. Many other manufacturers standard filters are bare glass, and bare glass can reflect as much as 10% of the light hitting it. This greatly increases the risks of flare and ghosting and reflections.

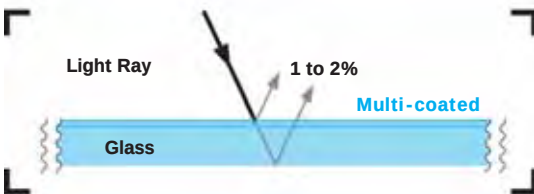


Hoya's single layer coating decreases light reflection off the surface from approx. 10% down to 4-5%.

Multi-Coating, Clearly Different



To provide photographers with a higher quality professionals require, Hoya created the Multi-coated line of filters. These filters have a 3 layer coating system that further reduces light reflections off the surfaces of the glass, the average is only 1-2%. This means that 98-99% of the light striking the filter is going through it, into the camera lens and onto the film. These layers of anti-reflective coating are bonded to the surface of the glass in a furnace at a temperature of up to 800 degrees F, so there is never any chance of the coatings coming off through normal use.



You should beware!

Some other manufacturers claim to have "coated" filters. But this coating is often only applied to the front side of the glass, not both sides like Hoya filters. Also, the coating on some filters is "painted" on or applied as a cold spray that wears off or can even flake off easily.

T H E D I F F E R E N C E



Best of the Best

In 1996 Hoya introduced Super Multi-coated filters to the photographic world. Consisting of a Skylight, 1B, UV (0), ND 2X, ND4X, and a low profile Circular Polarizer, this line of filters has a 5+1 layering system on each side of the glass: 5 layers of anti-reflective coating and a transparent easy-clean top coat. This reduces light reflections off the filter surface to an average of just 0.3%, meaning 99.7% of the light striking the filter is transmitted into the glass. This is the lowest reflective rate available, from any filter manufacturer.



The only exceptions are Polarizer and Circular Polarizer filters. No matter the brand or quality, they all are made of a polarizing film, or a polarizing film plus quarter wave plate in the case of the Circular Polarizer, sandwiched between two layers of what should be clear optical glass.

We've Been Framed!

Hoya believes the filter frame is an extremely important part of the filter as well. Hoya created precision machined aluminum frames to hold their high quality glass. They prefer aluminum to other materials because it is strong enough to hold up to years of use. Some say that brass is the best material to use. However, Hoya doesn't hold that view and here is why; brass is a far more rigid material than either aluminum, or other materials that are being use in today's lens barrels. This means that, should the front of the lens get hit, the rigid brass filter ring will transfer almost all the force of the shock to the lens barrels and mechanics within the lens. An aluminum filter frame will absorb some of the shock by bending, and at a certain point the glass will chip or break, which is what the filter is supposed to do, protect the lens! Replacing a filter is always preferable to getting a lens repaired.



I S C L E A R !



The Value in a Hoya Multi-coated filter

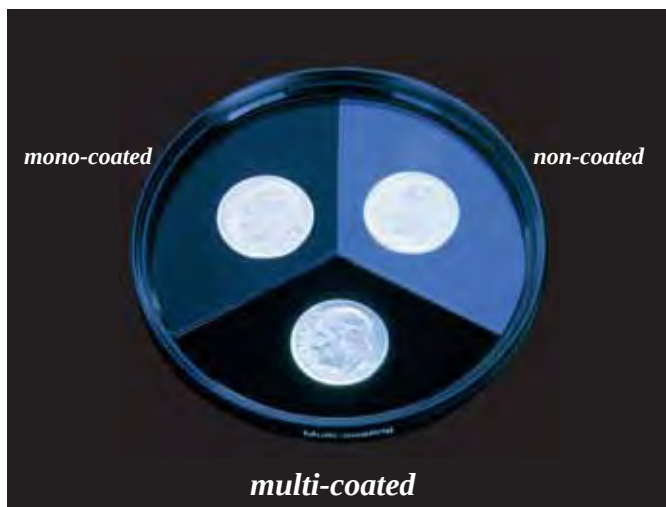
Wide aperture professional lenses are very expensive, and all photographers want to get the most speed, optical performance, and dollar performance from their investment.

Look at it this way, a customer pays \$800.00 for a 80-200mm f/2.8 lens. Then, to protect this investment the customer buys a cheap bare glass filter, which has a light reflection rate of 10%. This filter is literally slowing the lens down by 10% because that reflected light is not getting to the lens, or effectively turning an \$800 f/2.8 lens into the equivalent of a slower f/3.0 lens with a corresponding value of \$720. The value of the lens, along with the light, drops 10% when you put the cheap filter on it. The cost savings of the less expensive filter do not off set the loss of lens speed.

Also, this does not address the possible loss of sharpness or focus shift, which can have a detrimental impact on picture quality. For these reasons, Hoya multi-coated filters present the best value in filters available today.

Testing, 1, 2, 3...

Take a bare glass filter, hold it so that light reflection off the surface can be seen. Then take a long very thin object like a pin or the tip of a pen and hold it over the filter so that its reflection can be seen. There will actually be two reflections of the pin on the surface, one a little more pronounced than the other. The more pronounced reflection is from the front surface and the lighter one is from light reflecting off the rear surface. Now try it with a HOYA Multi-coated filter and see how much more dim the reflection is, a dimmer reflection means less light is reflected off the surface of the glass.

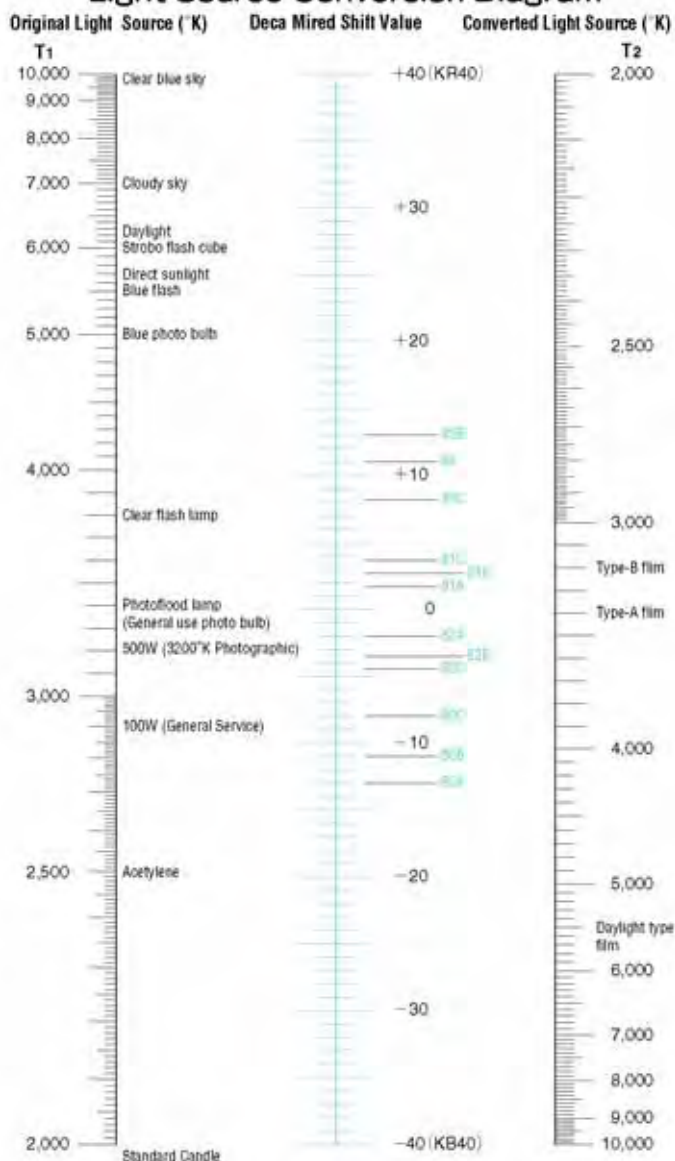


How to Select Color Conversion and Light Balancing Filters

Each color film is made to reproduce colors correctly when used with a specific light source. When other light sources are used, color conversion filters must be used to match the color of the light source to the film capabilities. Light balancing filters are used for slight adjustments of the color of the light source for cooler (bluer) or warmer (redder) tones.

The following table is given for your convenience in selecting the proper filter. To determine the necessary filter, make a line from the original light source (T1) to the converted light source (T2). The proper filter will be indicated at the point where this line crosses the center column.

Light Source Conversion Diagram



FILTER FACTORS

Since photographic filters absorb light, exposure must be increased to compensate for the effective light absorbed. The number by which the exposure must be increased, for a particular filter used with a particular film, is called the filter factor.

While these factors for basic applications are given below, as well as on the filter instruction sheet, the factor will vary according to the shooting conditions.

The precise filter factor is determined by considering the film type and specific light source. Therefore, filter factors indicated are for your reference only. The filter factor and exposure compensation required is as follows:

	Filter factor	f-stop
UVB	1	0
IB	1	0
FL	2-4	1 2/3-2
FL-Cir	2-4	1 2/3-2
FL-W	2	1
FL-Dio	2	1
SCA	2.4	1 1/3
SCB	2	1
SCC	1.8	1
SD	2	1
SCB	2.1	1
SCC	1.8	1
SCA	1.3	1/3
SCB	1.4	1/2
SCC	1.5	2/3
SLA	1.4	1/2

	Filter factor	f-stop
SB	1.4	1/2
SC	1.5	2/3
XC(Y)	2	1
GR	2.5	1 1/3
SAIR	2	1
XC(YG)	2.5	1 1/3
XIG	4	2
ND-2	2	1
ND-4	4	2
ND-8	8	3
Intensifier	1.4	1/2
Green Field	2.5	1 1/3
Blue Intensifier	2.5	1 1/3
Portrait	1.15	1/5
Warm	1.4	1/2

THE PRODUCTION PROCESS OF HOYA FILTERS

Automatic V-blender



Direct pressing machine



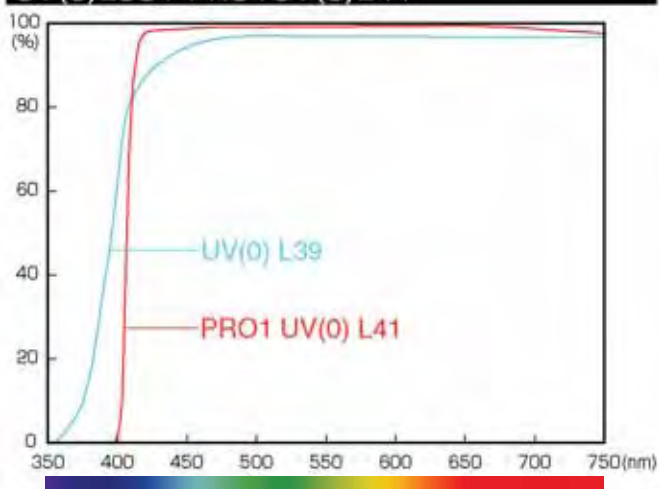
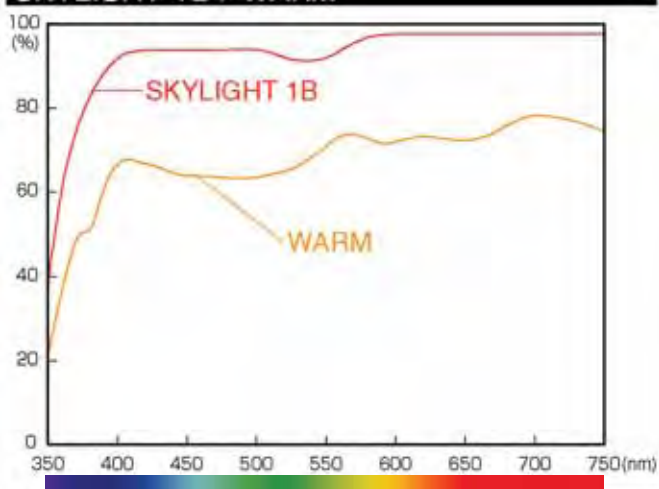
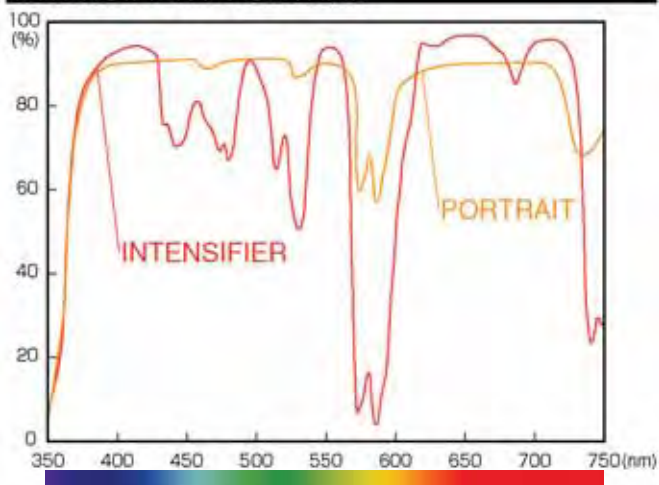
Continuous annealing furnace



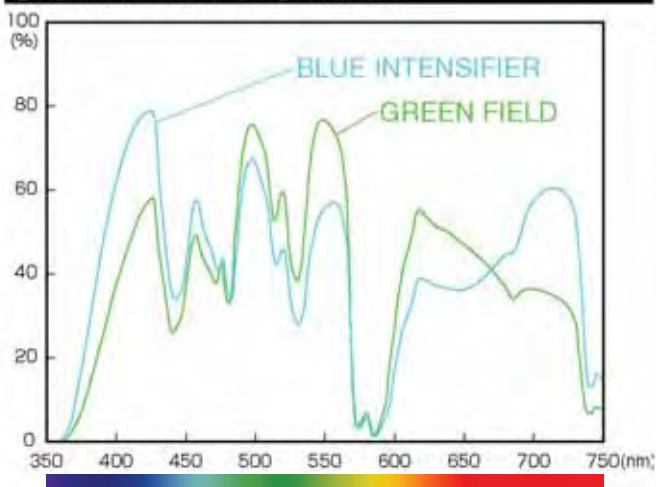
High speed polishing machine



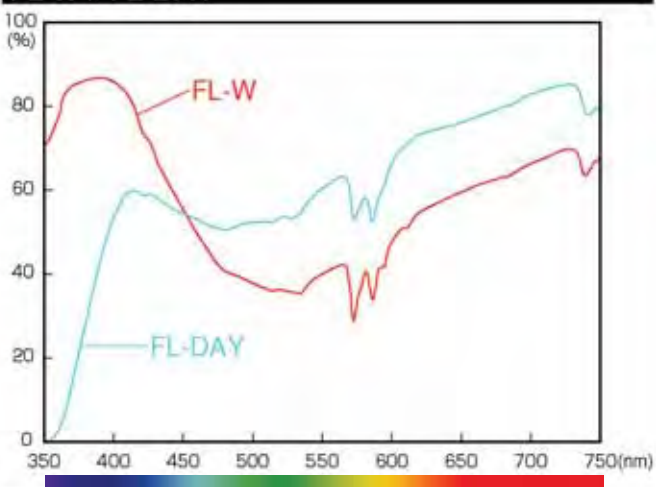
Vacuum evaporator

UV(0)L39 / PRO1UV(0)L41**SKYLIGHT 1B / WARM****INTENSIFIER / PORTRAIT**

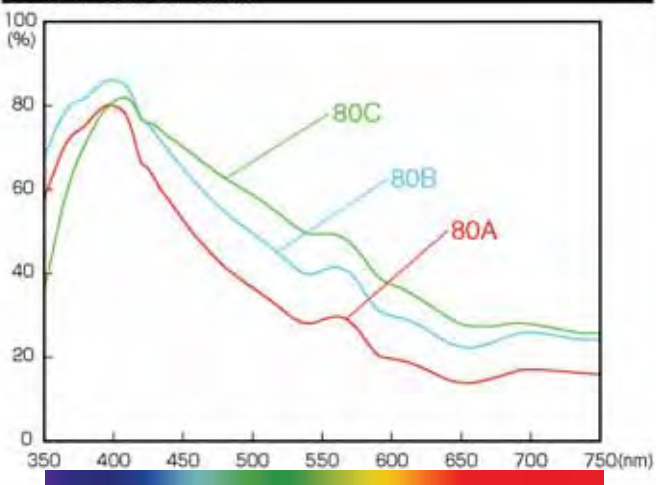
GREEN FIELD / BLUE FIELD

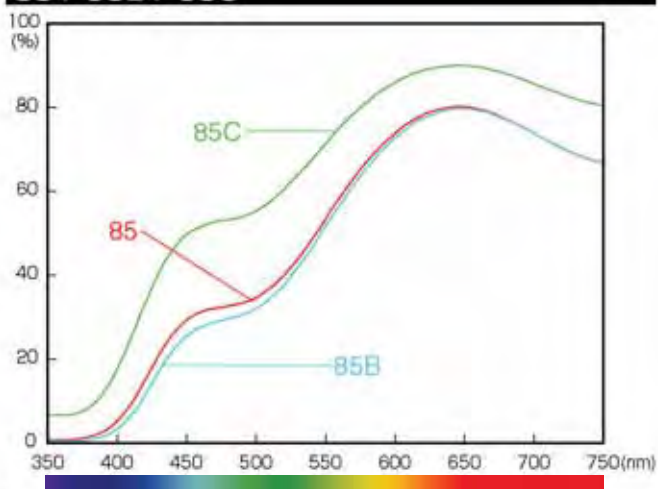
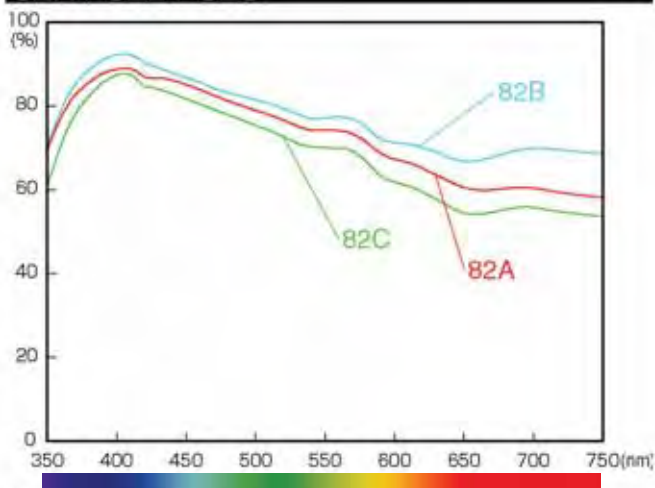
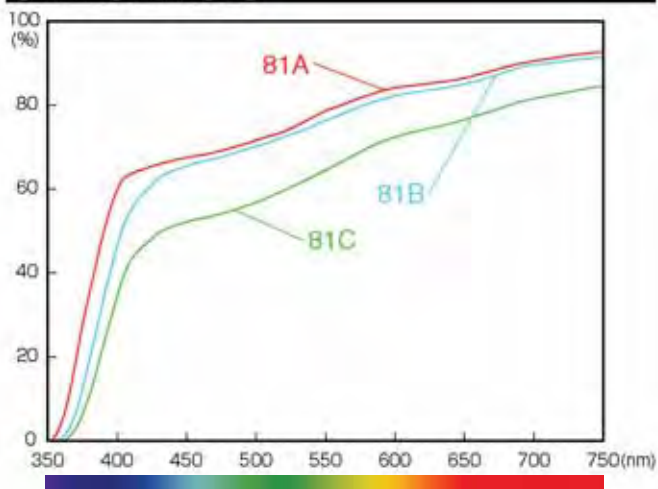


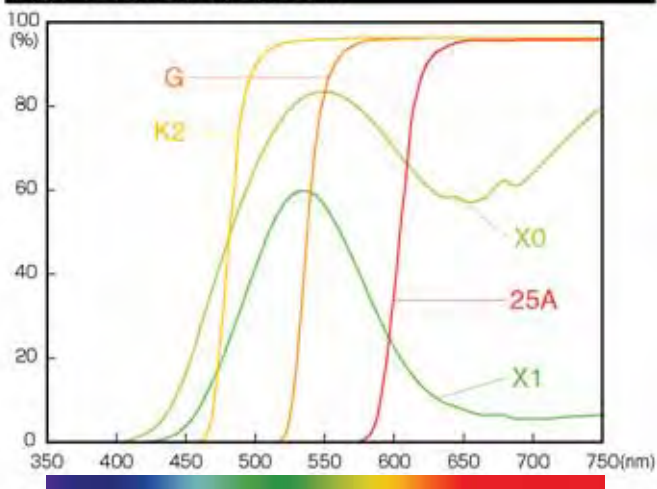
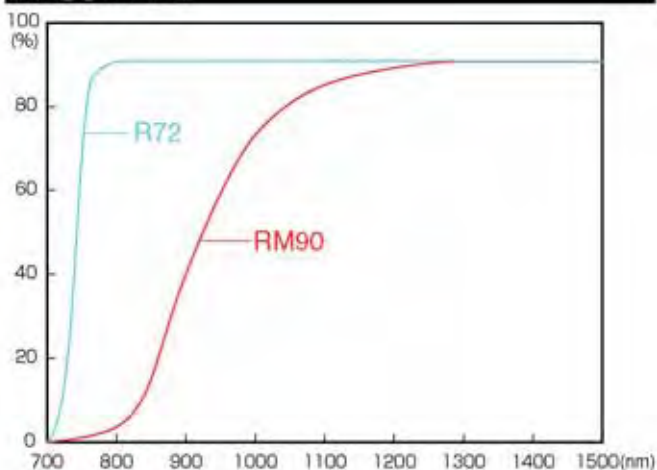
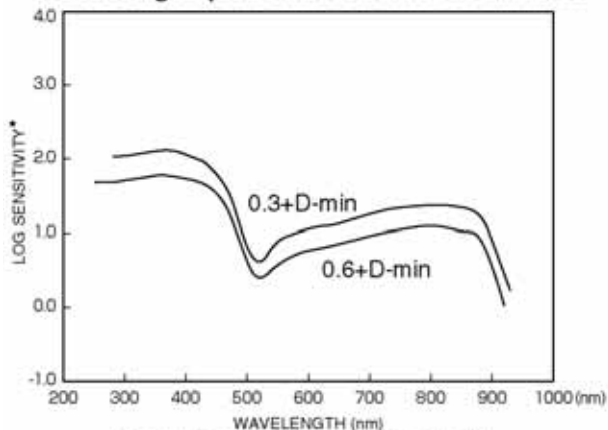
FL-W / FL-DAY



80A / 80B / 80C



85 / 85B / 85C**82A / 82B / 82C****81A / 81B / 81C**

X0 / X1 / G / K2 / 25A**RM90 / R72****Spectral-Sensitivity Curves for KODAK High Speed Infrared Film / HIE and HSI**

*Sensitivity = reciprocal of exposure (ergs/cm²) required to produce specified density

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Important Information:

- 1) When using color negative film with certain special-effect filters intended to give a false color to your pictures (Sepia, Fantasy Color, Dual Color, etc.), please ensure you inform your processing lab that these filters have been used. Otherwise, their equipment will automatically attempt to correct the colors and remove the desired effect.
(NB: This will not be of concern when using color slide film).
- 2) Certain ultra wide angle lenses have very convex front elements. In such cases, it is possible that a filter could make contact with the optics and cause damage. If in doubt, please place a small piece of paper between your lens and the filter when you first attempt to fit it. This will allow you to check if there is likely to be any contact, without the risk of any damage occurring.
- 3) Using filters with ultra wide-angle lenses can sometimes lead to vignetting, where the filter ring is seen as a shadow in each corner of the picture. To avoid this, we recommend that you choose ULTRA Series or Super HMC PL-CIR filters which have rings of just 3mm or 5mm thickness

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